

WHAT IS CLAIMED IS:

- 1 1. An absorbent article with a body facing side, the absorbent article comprising:
2 a topsheet on the body facing side;
3 a backsheet opposite the body facing side;
4 an absorbent core between the backsheet and the body facing side; and
5 a composite intermediate layer between the absorbent core and the topsheet, said
6 composite intermediate layer comprising:
7 a resilient three dimensional apertured formed film between the absorbent core and
8 the topsheet, said formed film having a male side and a female side opposite the male
9 side, and small scale apertures having a mesh count;
10 a nonwoven web of fibers between the formed film and the body facing side of the
11 absorbent article; and
12 a plurality of large scale apertures extending through the nonwoven web and the
13 formed film, said large scale apertures having a mesh count which is less than the mesh
14 count of the small scale apertures.
- 1 2. The absorbent article of claim 1 wherein the male side of the formed film faces the
2 nonwoven web.
- 1 3. The absorbent article of claim 1 wherein the female side of the formed film face the
2 nonwoven web.
- 1 4. The absorbent article of claim 1 wherein said large scale apertures are generally conical
2 in shape, tapering from a larger opening to a smaller opening, the larger opening being
3 between the smaller opening and the topsheet.
- 1 5. The absorbent article of claim 4 wherein said large scale apertures have generally
2 unconsolidated fibers near the larger opening and generally consolidated fibers near the
3 smaller opening.
- 1 6. The absorbent article of claim 4 wherein fibers of said nonwoven web are bonded at said
2 smaller opening by melted portions of said formed film.

- 1 7. The absorbent article of claim 1 wherein the mesh count of the small scale apertures is
2 between about $20/\text{cm}^2$ and about $200/\text{cm}^2$.
- 1 8. The absorbent article of claim 1 wherein the mesh count of the small scale apertures is
2 between about $50/\text{cm}^2$ and about $100/\text{cm}^2$.
- 1 9. The absorbent article of claim 1 wherein the mesh count of the small scale apertures is
2 about $90/\text{cm}^2$.
- 1 10. The absorbent article of claim 1 wherein the mesh count of the large scale apertures is
2 between about $2/\text{cm}^2$ and about $50/\text{cm}^2$.
- 1 11. The absorbent article of claim 1 wherein the mesh count of the large scale apertures is
2 between about $3/\text{cm}^2$ and about $30/\text{cm}^2$.
- 1 12. The absorbent article of claim 1 wherein the mesh count of the large scale apertures is
2 between about $6/\text{cm}^2$ and about $11/\text{cm}^2$.
- 1 13. The absorbent article of claim 1 wherein the mesh count of the small scale apertures is
2 between about 5 and about 25 times the mesh count of the large scale apertures.
- 1 14. The absorbent article of claim 1 wherein the mesh count of the small scale apertures is
2 between about 10 and about 20 times the mesh count of the large scale apertures.
- 1 15. The absorbent article of claim 1 wherein the mesh count of the small scale apertures is
2 about 15 times the mesh count of the large scale apertures.
- 1 16. The absorbent article of claim 1 wherein the nonwoven web is selected from the group
2 consisting of an airtough bonded nonwoven, a carded thermobonded nonwoven, and a
3 spunbond meltblown spunbond nonwoven.
- 1 17. The absorbent article of claim 1 wherein the nonwoven web is selected from the group
2 consisting of polypropylene fibers, polyethylene fibers, and a combination of
3 polypropylene and polyethylene fibers.

1 18. The absorbent article of claim 1 wherein the nonwoven web is comprised of polyester
2 fibers.

1 19. The absorbent article of claim 1 wherein the formed film is comprised of low density
2 polyethylene.

1 20. The absorbent article of claim 1 wherein the body facing side of the formed film is coated
2 with a surfactant.

- 1 21. A method of making a composite intermediate layer comprising the steps of:
2 forming a resilient three dimensional apertured formed film having a male side and a
3 female side, said formed film being formed with small scale apertures having a mesh count;
4 forming a nonwoven web of fibers;
5 joining the nonwoven web with the apertured formed film; and
6 aperturing the joined nonwoven web and formed film to create large scale apertures in
7 the joined nonwoven web and formed film, a plurality of said large scale apertures created at
8 a mesh count that is less than the mesh count of the small scale apertures.
- 1 22. The method of claim 21 wherein the forming of the resilient three dimensional apertured
2 formed film is performed by vacuum forming of the film.
- 1 23. The method of claim 21 wherein the forming of the nonwoven web of fibers is formed by
2 one of airtight bonding, carded thermobonding, or spunbond meltblown spunbonding.
- 1 24. The method of claim 21 wherein the joining of the nonwoven web to the formed film
2 includes the addition of an adhesive between the nonwoven web and the formed film.
- 1 25. The method of claim 21 wherein the aperturing of the joined nonwoven web and formed
2 film secures the nonwoven web to the formed film.
- 1 26. The method of claim 25 wherein the nonwoven web is secured to the formed film by the
2 fusing of the fibers of the nonwoven web to portions of the formed film at the large scale
3 apertures.
- 1 27. The method of claim 25 wherein the nonwoven web is secured to the formed film by the
2 melting of the formed film near the large scale apertures.
- 1 28. The method of claim 25 wherein the nonwoven web is secured to the formed film by the
2 melting of a plurality of the fibers in the nonwoven web near the large scale apertures.

- 1 29. The method of claim 21 wherein a large scale aperture is formed by a heated needle
2 mating into a shaped recess such that the apertures are resilient three dimensional.
- 1 30. The method of claim 29 wherein the large scale aperture is shaped by a contacting surface
2 of the needle and the shaped recess such that the fibers of the nonwoven web are
3 selectively fused only in the vicinity of the contacting surface.

1 31. An absorbent article with a body facing side, the absorbent article comprising: a topsheet
2 on the body facing side;
3 a backsheet opposite the body facing side;
4 an absorbent core between the backsheet and the topsheet; and
5 a composite intermediate layer between the absorbent core and the topsheet, said
6 composite intermediate layer comprising:
7 a stiffening means between the absorbent core and the topsheet, said stiffening means
8 having openings with a hydraulic radius;
9 a nonwoven web of fibers between the stiffening means and the topsheet, said
10 nonwoven web of fibers having an average radius of the fibers; and
11 a plurality of large scale apertures extending through the nonwoven web and the
12 stiffening, said large scale apertures having a hydraulic radius that is substantially greater
13 than the hydraulic radius of the openings of the stiffening means.

1 32. The absorbent article of claim 31 wherein the stiffening means is a resilient three
2 dimensional apertured formed film between the absorbent core and the body facing side,
3 said formed film having a male side and a female side opposite the male side.

1 33. The absorbent article of claim 31 wherein the stiffening means is a stiffer nonwoven layer
2 of fibers having a larger average radius of fibers.

1 34. An absorbent article with a body facing side, the absorbent article comprising:
2 a topsheet on the body facing side;
3 a backsheet opposite the body facing side;
4 an absorbent core between the backsheet and the topsheet; and
5 a three dimensional nonwoven layer between the absorbent core and the topsheet,
6 said three dimensional nonwoven layer having large scale apertures extending from the
7 proximity of the topsheet to the proximity of the absorbent core, the large scale apertures
8 having a conical shape such that only the smaller opening of the large scale apertures are
9 adjacent the absorbent core.